NOTES.

UPON inquiry made shortly before going to press yesterday we learned with regret that Sir David Gill was not quite so well; his condition is still a cause of anxiety.

WE record with regret the death on Wednesday morning, January 21, in his ninety-fourth year, of Lord Strathcona, High Commissioner in London for the Dominion of Canada, and Chancellor of McGill University, Montreal, and the University of Aberdeen.

THE Imperial Academy of Sciences of St. Petersburg has elected Sir Edward Thorpe as a corresponding member.

MR. G. W. HESS has been appointed to succeed the late Mr. C. Leslie Reynolds, as superintendent of the National Botanic Garden, Washington.

MR. J. I. CRAIG has been transferred from the directorship of the meteorological section of the Egyptian Survey Department to the controllership of the Department of Statistics, and has been succeeded at the survey by Mr. H. E. Hurst.

MR. W. D. MARKS, formerly Whitney professor of dynamic engineering at the University of Pennsylvania, has died at the age of sixty-four. He had been consulting engineer to several of the leading American cities, and was the author of a large number of scientific reports and papers.

THE death is reported, in his sixty-eighth year, of Dr. S. C. Chandler, of Wellesley, Mass. From 1864 to 1870 he served on the U.S. Coast Survey. He then spent fifteen years as a life insurance actuary. In 1896 he became editor of *The Astronomical Journal,* In recognition of his researches, Dr. Chandler had received the Watson gold medal, and the gold medal of the Royal Astronomical Society.

MR. A. H. COLE, a well-known American writer and lecturer on biological subjects, has died at Chicago at the age of fifty-seven. He had been connected successively with the Peddie Institute, Colgate University, the University of Chicago, and the Chicago Teachers' College. He developed a method of demonstrating the movement of sap in the leaves of plants, and also a plan of teaching biology from living plants and animals with a projection microscope. He also made important contributions to the production of anæsthesia in animals used in zoological laboratories.

RECENT American obituary includes the name of Prof. Winslow Upton, for nearly thirty years head of the department of astronomy at Brown University, Providence, R.I., and director of the Ladd Observatory since its erection in 1891. He was born in 1853, and held various posts in connection with the U.S. Lake Survey, the U.S. Naval Observatory, and the U.S. Signal Service, before receiving his academic appointment. He had taken part in several important eclipse expeditions, and in 1896–7 was absent on leave from Brown University for work at the southern station of Harvard University at Arequipa, Peru.

THE City of London Entomological and Natural History Society and the North London Natural History Society have been amalgamated to form the London Natural History Society. Meetings of the new society are held at Hall 20, Salisbury House, Finsbury Circus, London, on the first and third Tuesdays of the month. The new society starts its career with 190 members and sixty associates, and it has branches at Chingford and Woodford. Mr. L. B. Prout is president, and Mr. T. R. Brooke, 12 Warren Road, Chingford, with Mr. J. Ross, 18 Queen's Grove Road, Chingford, are joint secretaries.

THE late Capt. Scott's original journals written during his expedition to the south pole, have been placed on view in the manuscript department of the British Museum. The journals are to be exhibited to the public for an indefinite period, and it is to be hoped they may remain permanently in the British Museum. The records are contained in nine large notebooks, in which are the entries, written in ink, made on board the *Terra Nova* and after the party had landed at its headquarters; and six smaller books, of which three were used for the earlier sledging journeys, and three were taken to the pole.

THE views of Mr. R. Mond on the desirability of feeding infants on raw milk and the little danger of tuberculous infection therefrom, referred to in NATURE, January 8, p. 537, have, according to *The Times,* aroused considerable interest. Mr. Charles Bathurst, M.P., speaking at a meeting of the Gloucestershire Farmers' Union, expressed his concurrence with the views of Mr. Mond, and submitted that the Royal Commission on Tuberculosis in its final report had gone far beyond its own experiments in assuming that human and bovine tuberculosis are intercommunicable. Sir James Barr and Dr. Latham, on the other hand, consider that there is a real danger of contracting tuberculosis from raw milk.

A LEAGUE, entitled the "Lega Nazionale per la Protezione dei Monumenti Naturali," has recently been formed in Italy for the protection of the fauna and flora of the country, and of such geological and geographical features as are of scientific and æsthetic interest. The existence of these objects of natural beauty and interest is now threatened from various sides, and to so great an extent that concerted action is necessary for their preservation. The headquarters of the league are in Rome, Prof. R. Pirotta, the director of the Royal Botanical Institute of Rome, being president of the organising committee. The association hopes to accomplish its object by the assistance of (1) an active propaganda, including publications, conferences, excursions, &c.; (2) legislative enactments for the safeguarding of natural objects of interest; (3) the establishment of reserves and national parks. The executive council includes a zoologist, a botanist, a geologist, a geographer, and an agriculturist.

THE probability that another Antarctic expedition will be in the field at the same time and in the same quarter as Sir Ernest Shackleton's appears to afford reason for nothing but satisfaction, as the objects of the two are not mutually exclusive. Dr. Felix König intends to lead an Austrian expedition from Buenos

Aires in the middle of this year. His base will be in the Weddell Sea, and he has planned sledging expeditions for three parties in different directions for the exploration of the adjacent parts of the Antarctic continent, followed by an advance to the pole. His scheme, except in so far as it does not include a journey across the continent as Shackleton's does, certainly resembles the latter closely, but it can scarcely be supposed that there is not room for both. Dr. König's expedition will carry a wireless telegraphic installation, and leave another in South Georgia. With his experience in the recent German expedition, and the advice of Count Wilczek and Capt. Amundsen, Dr. König is well fitted for success, and between Sir Ernest Shackleton's work and his the great physiographical problem of the relationship between the eastern and western parts of the Antarctic land-area should in two or three years be on the way toward solution.

THE collection of the late Dr. Franklin Parsons, formerly of the Local Government Board Medical Service, has been left to the Croydon Museum, and consists of many thousands of geological, zoological, and botanical specimens. Unfortunately, the Corporation of Croydon has not at present seen its way to accept the valuable bequest. A proposal of the Roads Committee, which has the care of the park in which the Grange Wood Museum is situated, that the gift should be declined, was referred back, so that the collection might be examined by experts before a final decision is arrived at. A great deal of the collection is of considerable local interest. Some expense would be incurred for arranging and housing the collection, and there is a growing feeling that the oversight of the museum should now be transferred to the Libraries Committee, with a regular annual grant for its upkeep. The specimens now bequeathed are for the most part in good condition, and accurately labelled, and would be acceptable to any local museum. It is proposed by experts who are now examining the collection that the duplicates should be distributed amongst the schools in the borough, and no doubt in any case these will be greatly enriched by the bequest. An opportunity is now afforded of putting the Croydon Museum on a sound basis as regards upkeep and development.

THE question of the systematic teaching of the principles of anthropology raised, not for the first time, by Sir R. Temple, at the Birmingham meeting of the British Association, has now reached a practical stage. The proposal, supported by distinguished administrators in India and the Colonies, finds further justification in the recent report of the Commission on University Education in London, which states that "it is almost as important that officials, and others intending to spend their lives in the East or in parts of the Empire inhabited by non-European races, should have a knowledge of their racial characteristics as that they should be acquainted with their speech, and we believe that the Colonial Office shares this view." The scheme now prepared by a committee provides for the collaboration of the Royal Anthropological Institute, the British Association, the universities, the Foreign, India, and Colonial Offices, and the Civil Service Commissioners, in supporting existing schools of anthropology, establishing them where they do not exist, and providing laboratories, libraries, and museums. In support of these proposals a meeting is announced to be held at Drapers' Hall, on Thursday, February 19, with the Earl of Selborne in the chair, when a deputation will be appointed to lay the proposals before the Prime Minister. The matter has been more than once brought before the Ministry, but never with such well-organised support; and it will be little short of a scandal if these representations fail to secure the adequate settlement of a question of great public importance.

A ROUTE by which it is possible to penetrate to the bottom of the Vesuvian crater, more than 1200 ft. below its rim, was discovered some time ago by Prof. Alessandro Malladra, and has already been utilised for the purpose of obtaining a kinematograph film, Mr. F. Burlingham, an American operator—who had already shown his skill and boldness by getting a pictorial record of an ascent of the Matterhorn—accompanied by two of the "crystal-hunters" of Vesuvius, acting as porters, accomplished the difficult feat without misadventure either from stone avalanches or poisonous gases, and the results of the undertaking are now being exhibited in London. Although these results are more important from a spectacular than from a scientific point of view, yet there can be little doubt that Mr. Burlingham, by proving that not only can a descent be safely made, but that heavy apparatus may be conveyed to the crater-floor, has paved the way for scientific work, in which temperature observations, the collection of gases for analysis, and similar investigations may be carried out. In *The Times* of January 13 Mr. Burlingham has given, under the title, "Inside Vesuvius: Lessons from a Descent of the Crater," a very clear and modest account of his remarkable feat. He believes that his observations indicate that a new eruption of Vesuvius is more imminent than the officials at the observatory anticipate, but he at the same time admits that the formation of a lateral vent and flow of lava on the flanks of the mountain may falsify his predictions on the subject. The kinematograph has already proved its usefulness in many lines of scientific research, and may in the future render valuable aid in vulcanological studies.

DR. E. T. WILSON, president of the Cheltenham Natural History Society, has published a useful paper on the long-barrow men of the Cotswolds. He gives a good summary of the excavations of a large series of barrows, describing their construction, and the furniture of the interments. The history of their builders, he remarks, "teems with contradictions and puzzles which will require for their solution the additional evidence to be obtained by the opening up of unexplored barrows in Gloucestershire and Wilts." But as much valuable material has already been lost by careless investigations, it may be hoped that future excavation will be deferred until it can be systematically undertaken by qualified experts.

To the June issue of the *Bull. Ac. Sci. Cracovie* for 1913, pp. 335–412, Mr. Jan Nowak contributes the third part of his illustrated memoir on the ammonites and other cephalopods of the Upper Tertiary of Poland, with descriptions of several new species.

ACCORDING to the Zoological Society Bulletin (New York) for November, the longest, although by no means the heaviest, lobster on record was received at the New York Aquarium in September. It measured 38 in. in length, and weighed 21 lb.; in 1887 the aquarium received a specimen measuring 24 in. in length, and weighing 34 lb., this, so far as known, being the record for weight.

THE affinity between the Tertiary mammalian faunas of eastern Europe and North America indicated by the occurrence of Titanotherium in the former area is strengthened, if the generic determination be correct, by Mr. Niezabitowski's reference (*Bull. Ac. Sci. Cracovie,* 1913, pp. 223–25), of an imperfect rhinoceros skull from the Pliocene of Odessa to the North American Tertiary genus, Teleoceras, under the name of *T. ponticus.* Although the upper teeth present considerable resemblance to those of *Aceratherium schlosseri* from Samos and *A. blanfordi* of Baluchistan, they are stated to come still closer to those of the American genus.

THE exchange of plants between botanical gardens in various parts of the world is well known to have a considerable influence upon the geographical distribution of invertebrate animals. A classical example of this is the occurrence, first made known in 1880, of the fresh-water medusa, *Limnocodium sowerbyi,* in the *Victoria regia* tanks of the Royal Botanical Society in Regent's Park. In 1892 a remarkable fresh-water Oligochæte was discovered by Beddard in the same situation, and named by him *Branchiura sowerbyi,* one of its most interesting features being the possession of branchial appendages on the hinder part of the body. Otherwise the worm closely resembles the common European Tubifex. Branchiura has since been found in India, which is now believed to be its native habitat. It has also appeared in several places in Europe, and in a recently published memoir (*Zeitschrift für wissenschaftliche Zoologie,* Bd. cvii., p. 199) Friedrich Keyl makes some contributions to our knowledge of the anatomy of this remarkable worm, and summarises our knowledge of its distribution. It occurs in large numbers in the Victoria Regia house at Göttingen, and has been found in similar situations at Hamburg, Frankfurt a.M. and Dublin, while in the mild climate of Tournon, in the south of France, it has naturalised itself in the Rhone. Such facts as these clearly demonstrate the necessity of a thorough investigation of the terrestrial invertebrate fauna of the earth before the problems of geographical distribution have become more seriously complicated by human agency.

J. VAN BAREN, in a paper published, with a German summary, by E. J. Brill, of Leyden, emphasises the existence of an older and a younger series of dunes, separated by a peat layer, on the northern part of the coast of Holland, and attributes the break between them to an elevation of the land. Subsidence in the Christian era has given us the outlying islands and the straight west coast of the country, on which marine denudation is at work.

THE Canadian Department of Mines has issued the first Bulletin of the Victoria Memorial Museum in Ottawa, an institution which, in its new and handsome building, was obviously fated to have a journal of its own. Palæontology is naturally prominent, since the museum is under the care of the Geological Survey; but it may be hoped that this connection will lead to the establishment of a natural history survey for the Dominion, based on the explorations which are due to the energetic geological branch.

DR. G. LINCK'S *Fortschritte der Mineralogie Kristallographie, und Petrographie,* which is the organ of the German Mineralogical Society, continues to justify its existence by the publication of authoritative essays on the progress of the sciences concerned. In vol. iii. for 1913 (price 10 marks) R. Marc discusses the mineralogical significance of the chemistry of colloids, and F. Rinne has an important paper, with a bibliography, on the decomposition of zeolites.

MR. S. FUJIWHARA has recently published an important memoir on the abnormal propagation of sound-waves in the atmosphere (Bull. of the Centr. Meteor. Obs. of Japan, vol. ii., pp. 1–143). The observations on which his work is based are chiefly those of the sound-waves due to the eruptions of Asama (Central Japan) from 1909 to 1912 (see NATURE, vol. lxxxix., pp. 487–8). The principal facts to be explained are the great extension of the region of audibility in a special direction, as a rule easterly, from the source of sound, the division of the sound-area into two parts, with an intervening silent region, and the repetition of the sounds with intervals of a few seconds in certain districts. Mr. Fujiwhara's investigation, which is mainly mathematical, leads him to the conclusion that variations of the wind-velocity are chiefly responsible for the anomalous propagation of the sound-waves. He shows that, when the eruptions occur under normal weather conditions, with the velocity of the wind increasing with the height above the ground, then the anti-trade winds and monsoons would assist the easterly propagation of the sound-waves, and there would be no silent regions and no repetition of the sound. But if, as one example, the velocity of the wind should increase with the height up to a certain altitude and then decrease, a silent region should exist within certain limits, and the sound should be heard twice or thrice in others owing to the sound-rays following different paths from the source to the multiple-sound area.

IN *Science Progress* for January Sir Oliver Lodge's presidential address to the British Association is discussed from two points of view by Dr. F. C. S. Schiller ("The Logic of Science"), and by Mr. H. S. Shelton ("The Philosophy of Science"). Dr. F. W. Mott's third Chadwick lecture on the influence of nutrition and of education in mental development occupies some twenty pages, and Prof. Priestley publishes a second instalment of his article on enzymes as synthetic agents. One of the most interesting general articles is that contributed by Dr. E. Halford Ross on recent advances in our knowledge of syphilis, in which an account is given of the results obtained in the course of the McFadden researches at the Lister Institute; the complete cycle of development of the sexual and asexual elements of the *Lymphocytozoon pallidum,* which is held to be responsible for the disease, is described and illustrated. One of the most important results established is the occurrence in nature of syphilis in the rabbit and other lower animals.

FOR some years past the British Fire Prevention Committee has been directing attention to the question of the danger of celluloid, more particularly in connection with the kinematograph film trade. A special report, having the title, "Celluloid Dangers with Some Suggestions," has been compiled on behalf of the committee, and was recently laid before the Celluloid Committee of the Home Office, which has adopted many of its suggestions. The report is, however, largely intended for the guidance of local authorities, with the view of showing what appears to be technically possible, so that the authorities may be assisted in their administration and guided in introducing bylaws to minimise the dangers. The report, which is illustrated and supplemented with tables, is divided into two parts; the first deals with the dangers of celluloid, including films, the various uses to which celluloid is put, and the large number of fires in which it has been a feature; the second part deals with the methods of extinguishing celluloid fires, and suggests possible safeguards. The report is obtainable from the committee's offices, 8 Waterloo Place, Pall Mall, S.W.

ON several previous occasions attention has been directed in these columns to the Bulletin of the Calcutta Mathematical Society, not so much on account of the original papers published in it as because it contains notes, reviews, and short notices of a miscellaneous and personal character attempting to chronicle the main events which are passing in the mathematical world. We have now received vol. i., No. 4, January, 1913, the date of receipt at the offices of NATURE being November 8, 1913. It possesses all these excellent features in a similar degree to its predecessors, but it will be found that all the "Notes and News" refer to the year 1909. Information of a somewhat similar kind is published regularly in the Bulletin of the American Mathematical Society, but here, however, the activity and energy of American and German mathematicians quite throws British interests into the shade. Neither the Proceedings of the London Mathematical Society nor the *Mathematical Gazette* attempts anything of this kind, both being published in the interests of writers rather than of readers. It is surely desirable that some further attempt should be made to keep both the mathematicians and the non-mathematicians of Greater Britain posted up in the events that are taking place in the mathematical world.

WE have received a copy of a paper on an electrical measuring machine read before the Institution of Mechanical Engineers in April last, by Dr. P. E. Shaw. The machine is intended for the accurate measurement of length gauges with plane or spherical ends, and makes use of the principle of electrical touch, that is, contact with the end surfaces is determined when a telephone circuit is completed thereby. End gauges may be compared with line standards, and comparative readings can be relied on to 1/10,000 of a millimetre. With a measuring machine of this high order of accuracy it is possible to show that some of the end gauges at present in use in engineering practice have errors amounting to 15/10,000 of a millimetre. It appears that the gauges turned out by Johansson, of Sweden, and by some of the American machinists are so accurate as to demand the best available measuring appliances to detect their errors. The machine has been installed at the National Physical Laboratory.

THE December issue of the Journal of the Franklin Institute contains, among other articles, a paper by Mr. F. W. Peek, jun., dealing with the "dielectric circuit" from the view-point of high-voltage engineering. Mr. Peek devotes most space to transmission lines, and points out that air is the principal insulation, the line insulation being used for mechanical support. The dielectric circuit was not until recently understood, but it is now known that breakdown of insulation occurs when this is too much stressed, *i.e.* when the dielectric flux is too dense. Gaseous and liquid insulators, broadly speaking, behave in the same manner. It has been observed that the surface flux density, or the gradient at which visual corona starts or breakdown occurs, is higher for small conductors than for large ones—that is, air round small conductors has an apparently greater strength than around large ones. Investigation, however, has shown that the following explanation is probably correct. The strength of the air is constant, and is equal to 30 kilovolts per cm., but energy is necessary to start rupture. Therefore rupture cannot start at the surface, but only after the surface gradient has been increased sufficiently to store the rupturing energy between the conductor surface and a distance of $0{\cdot}301\sqrt{r}$ cm. away in air, where r is the radius of the conductor. The author deals with the grading of cables, the methods of breakdown in solid insulators, &c., and shows how, by the production of water vapour, the needle gap method of measuring voltages may give readings anything up to 30 per cent. too high when voltages are being measured. The use of spheres is recommended.

THE Journal of the Royal Society of Arts for December 5, 1913, contains a paper on perfumery, read before the society by Mr. J. C. Umney. The contribution consists largely of an account of the natural odoriferous oils and the various synthetic products used in perfumes. It is pointed out that whilst Rimmel in 1860 classified the essential oils chiefly according to their source—animal, floral, herbal, and so on—a classification based upon the main chemical constituents of the oils could now be adopted. Thus the geranium oils, citronella oil, and otto of rose, all containing the alcohol geraniol, are distinguished as the geraniol group; the linalol group includes lavender, neroli, and bergamot oils; and the eugenol group contains the oils of clove, pimento, and bay. Mention is made of the fact that there is a systematic manufacture of bodies designed solely for the purpose of adulterating perfumes; the adulterants include glyceryl acetates, ethyl citrate, laurate, succinate, and phthalate, and methyl phthalate. Some stress is laid on the bactericidal properties possessed by certain of the essential oils; for example, origanum oil, the most effective of those referred to, is stated to have a "carbolic acid coefficient" of 25·76, attributable to the high proportion of carvacrol it contains. Other examples of such coefficients are given, ranging down to 4·94 for lavender oil and 1·0 for oil of cade. It is stated that the protective power of lemongrass in keeping off the tsetse-fly has led to the cultivation of the plant and the distillation of lemongrass oil in Uganda.

With reference to Dr. Rosenhain's letter in Nature of January 8, upon a new method of etching steels, Dr. C. H. Desch directs attention to papers by Prof. F. Giolitti (*Gazz. chem. ital.*, 1906, vol. xxxvi., ii., p. 142; 1908, vol. xxxviii., ii., p. 352) upon the use of the electro-chemical deposition of copper in the etching of bronzes. Prof. Giolitti's work does not, however, anticipate the use of the new reagent for steel described by Dr. Rosenhain, and particularly for the study of phosphorus distribution, although it seems probable that the banded structure of phosphoritic steel is a direct consequence of core formation during the first solidification of the steel.

A paper dealing with commercial tests of internal-combustion engines was read at the Institution of Mechanical Engineers on Friday last, January 16, by Mr. W. A. Tookey. In such tests, it is usually not possible to obtain measurements other than the gas consumed or liquid fuel used, indicator diagrams, bore and stroke of the cylinder, and the valve settings. From this information, advice has to be tendered regarding possible improvements in the engine, and Mr. Tookey advocates the use of a factor obtained by dividing the mean pressure, as shown by the indicator diagram, by the mixture strength. The mixture strength is defined as the calorific value, in British thermal units, of one cubic foot of stuff in the effective cylinder volume, and may be calculated with good approximation from the cylinder dimensions and the information to be obtained from ordinary and light-spring indicator diagrams. The author uses the index 1·3 for the compression curve, and has found his factor to be of great service in dealing with more than 700 gas engines which he has tested during the last few years on behalf of London gas companies.

The Morning Post has published an exhaustive list of congresses of learned societies and other bodies to be held during the present year, and some which have been announced for future years. The list is arranged conveniently on a large card for hanging on the wall, and should prove very valuable as a source of reference to forthcoming events.

Messrs. J. and A. Churchill write to point out that the price of "Who's Who in Science," which was briefly noticed in last week's Nature (p. 553), was incorrectly given as 2*s.*, whereas it is 10*s.* net.

OUR ASTRONOMICAL COLUMN.

Spectra of Stars near the North Pole.—In the Harvard College Observatory Circular, No. 180, we are informed that in the preparation of the revised Harvard Catalogue Miss Cannon has now classified the spectra of 110,000 stars covering more than one-half of the sky. As Prof. E. C. Pickering has received numerous requests for the spectra of stars near the pole the present circular contains a special list, prepared by Miss Cannon, of stars within 10° of it. All stars are included which have a magnitude in the Durchmusterung of 8·3 or brighter, and the table consists of three columns giving the number in the Durchmusterung, the photometric or Durchmusterung magnitude, and the type of spectrum. The number of stars included in this list is 825.

Change in Lunar Crater Eimmart.—Prof. W. H. Pickering, writing from the Harvard Astronomical Station at Mandeville, in Jamaica, records, in a recent number of the *Astronomische Nachrichten*, No. 4704, a change in the lunar crater Eimmart which has lately taken place. The change in appearance, he states, is so noticeable that he considers it desirable to direct the attention of astronomers, and especially of selenographers, to it at once, as it is the most marked non-periodic change that he has ever observed. The crater lies on the north-western border of the Mare Crisium in long. 295°, lat. +24°, and is about twenty-five miles in diameter. The general nature of the change is shown in the two illustrations which accompany his communication. While formerly, at each lunation, the crater apparently gradually filled up and overflowed with a white material, the source of which was at a point at the foot of the northern interior slope, this change no longer occurs. The last regular eruption observed, if, as Prof. Pickering states, it is considered proper to use this term, occurred in January of last year. Observations in February and March of last year indicated a reduction in activity, while in April and May of the same year the activity was scarcely noticeable. The point Prof. Pickering desires to be settled is this:—When the moon is just past first quarter, Eimmart was distinctly brighter than any area of similar size between it and the limb. This is not the case at present, and the question is, Will this condition ever occur again? Details of his observations are given in his paper, and he indicates other differences in appearance of this crater, in addition to that above mentioned.

The Madrid Observatory Annual for 1914.—The first portion of this annual is continued on the same lines as in previous issues, and consists of the different forms of calendars, ephemerides of the members of the solar system, and useful astronomical tables and the explanations of them. These occupy about 200 pages. Then follows a series of sections relative to other astronomical matters. The first is devoted to practical rules for the installation of an equatorial and the study of the correction of the objective. An account is next given of the proceedings of the International Solar Union meetings at Bonn. The observations of solar prominences made during the years 1907–12 are next studied and described in some detail, succeeded by the observations of spots, prominences, flocculi, and radiation made for the first two phenomena during the year 1912, and for the last two for the twelve months ending September and August, 1913, respectively. These take up about another 200 pages. The last portion is devoted to the meteorological observations made during the year 1912, with an annual summary, and occupies about 150 pages.